



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Matematica I

2122-1-E2701Q001

---

#### Aims

The objectives of the course are the following.

**Knowledge and understanding.** The student will learn the main results for the theory of Calculus.

**Applying knowledge and understanding.** By means of several examples and exercises, the student will develop the ability of applying the theoretical results presented in the lectures to specific problems.

**Making judgements.** The student will be able to face critically the study of function of one variable and related problems.

**Communication skills.** The student will become familiar with the language and formalism of Calculus, which will make him/her able to communicate with rigor and clarity the acquired knowledge.

**Learning skills.** The student will be able to apply the acquired knowledge to different contexts and to examine in depth some related topics by autonomous reading of books of Calculus.

#### Contents

Sets and functions; sequences and series; limits; derivatives; integrals.

#### Detailed program

- Sets and functions: rational, real, and complex numbers; polynomial and rational functions; trigonometric,

exponential, and logarithmic functions.

- Sequences: basic definitions; subsequences; limits for sequences.
  - Series: basic definitions; convergence; convergence tests.
  - Limits for functions: limit definitions; limit from the left and the right; uniqueness; techniques for the calculus of limits.
  - Derivatives: basic definitions; derivatives of the sum, of the product, of the quotient, and of the inverse function; chain rule; Taylor formula.
- 
- Integrals: integration by parts and with substitutions; Riemann integral; Fundamental Theorem of calculus; applications to the calculus of area and volume.

## **Prerequisites**

## **Teaching form**

Lessons and tutorials.

Lessons and tutorial will be in presence.

## **Textbook and teaching resource**

- M. Conti, D.L. Ferrario, S. Terracini, G. Verzini: Analisi matematica, Vol I, dal calcolo all'analisi, Apogeo, 2006.

## **Semester**

First year, first period.

## **Assessment method**

## **Office hours**

On appointment (via e-mail)

---